

From glowbugs@theporch.com Thu Oct 17 11:23:30 1996
Return-Path: <glowbugs@theporch.com>
Received: from uro (localhost.theporch.com [127.0.0.1]) by uro.theporch.com
(8.8.0/AUX-3.1.1) with SMTP id LAA23336; Thu, 17 Oct 1996 11:09:41 -0500 (CDT)
Date: Thu, 17 Oct 1996 11:09:41 -0500 (CDT)
Message-Id: <199610171609.LAA23336@uro.theporch.com>
Errors-To: conard@tntech.campus.mci.net
Reply-To: glowbugs@theporch.com
Originator: glowbugs@theporch.com
Sender: glowbugs@theporch.com
Precedence: bulk
From: glowbugs@theporch.com
To: Multiple recipients of list <glowbugs@theporch.com>
Subject: GLOWBUGS digest 323
X-Listprocessor-Version: 6.0c -- ListProcessor by Anastasios Kotsikonas
X-Comment: Please send list server requests to listproc@theporch.com
Status: 0

GLOWBUGS Digest 323

Topics covered in this issue include:

- 1) Status Report on 6LR8 based TX
by Chris Broadbent <cfb@bga.com>
- 2) Parts needed (tubular!)
by "Brian Carling" <bry@mail11.mnsinc.com>
- 3) RCA BTA 5T 5kw PARTS FS:
by "Robert Fowle (KC8DBC)" <hammarlund@jacksonmi.com>
- 4) Free CDs for dial plates
by jefffd@coriolis.com (Jeff Duntemann)
- 5) Found a nice 1843khz rock source for glowbugging
by rdkeys@csemail.cropsci.ncsu.edu
- 6) Re: Status Report on 6LR8 based TX
by mjsilva@ix.netcom.com (michael silva)
- 7) Re: Status Report on 6LR8 based TX
by mjsilva@ix.netcom.com (michael silva)
- 8) email list devoted to AM
by Jeffrey Herman <jherman@hawaii.edu>
- 9) Re: SAQ Alternator Test Transmission
by Bob Roehrig <broehrig@admin.aurora.edu>
- 10) VLF Frequency List
by Conard Murray <conard@tntech.campus.mci.net>
- 11) Re: QRP xmtrs
by "Brian Carling" <bry@mail11.mnsinc.com>

Date: Wed, 16 Oct 1996 14:05:43 -0500 (CDT)

From: Chris Broadbent <cfb@bga.com>
To: glowbugs@theporch.com
Subject: Status Report on 6LR8 based TX
Message-ID: <199610161905.0AA07012@zoom.bga.com>

Hello all,

First, once again I must thank everyone here for the wonderful advice you have given me - especially putting up with what must be annoying newbie type questions. I figure I owe everyone a status report.

Well, two weekends ago I made my first contacts using my freshly rolled 6LR8 based TX. I'm 35, but I could have been 5 for the excitement I felt at getting a response. Not only was this a response to my new homebrew TX, it was my first response as a Ham! Man, I was walking on air after that. The very kind gentleman gave me detailed (complimentary!) reports on my signal stability, etc.

My furthest contact to date is either with a gentleman in Ramona, CA or with someone in SC. The latter contact faded shortly after trading callsigns so maybe that doesn't count. I live in central TX, so I guess the signal is getting out. For a receiver, I was using either my National NC-57, or (please don't laugh) my Realistic DX-440. Both have a passband far too wide for serious CW work. I prefer the National, as it is in a metal box and doesn't leak much when I'm transmitting. The 440 has a digital frequency readout, which is useful at times. The problem is, it leaks badly (plastic body) and makes horrible noises when I key.

As luck would have it, last week I purchased a National NC-125 over the net. It has what appears to be an additional regen stage with boost and frequency controls that allow one to really pull out just the one morse signal desired. In fact, it can get so narrow, it rolls off the attack and decay of the beep. Just what the doctor ordered for reception.

However, I still would like to roll my own regen receiver, perhaps using similar crystals to those used in my TX in the oscillator (just an idea, I don't know how feasible it will be to do that).

BTW, my antenna is a half wave dipole, made of #14 insulated stranded copper wire (500ft for ~\$16 at Home Depot). I have about a half acre lot with about a hundred or so trees in the back. Unfortunately, trees here don't grow to be very high (mostly cedar, with some oak and a few others). So I had to thread the antenna through and between the branches. It is nowhere near high enough and I'm sure the trees are playing havoc with the signal. I'll work on that later, though.

My transmitter doesn't put out as much power as I had originally anticipated

(it delivers between 10W and 15W into the antenna on 80M, depending on load) and doesn't work well on 40M. But it works very nicely on 80M. I am very pleased, despite the adjustments in expectations. After all, this is my first foray into real tube design (educated mostly on semiconductors).

The 6LR8 is a double tube device - containing a triode oscillator and a pentode amplifier. In my TX, the oscillator is crystal controlled and set up in an electron coupled Colpitt's arrangement. I have included four crystal sockets, allowing me to switch between four frequencies. The pentode is set up as a class B/C amplifier, feeding a Pi network (variable caps to ground, coil between the caps).

I wound the coil on a quality PVC pipe stub connector (after cutting off the threaded ends), using #21 enamelled magnet wire. I had trouble getting the wire to 'hold' on the form. I found that a neatly wound layer of electrical insulation tape provided a surface into which the wire could bite. Thereafter, no problem winding it and a neat result. Orr's radio handbook has a wonderful nomograph in the appendices, allowing one to determine the inductance of a single layer air core coil from its length, diameter and number of turns.

The power supply uses an old TV transformer and a semiconductor bridge - feeding a pair of 100uF 450V capacitors, separated by a 270 Ohm 10W resistor. The unloaded voltage is around 280V, dropping to around 255V under load.

The whole thing is assembled on a 6" x 10" x 2" aluminium chassis (made by Hammond, costs about \$11 at AES). The tube, coil, variable caps and transformer all are mounted on top of the chassis, with the rest being underneath. In the layout, I tried my best to keep the low powered components below the chassis, with the heavy stuff above and keep the tube, transformer and Pi network as far from one another as possible (not easy on this small a chassis). I also assembled a bit of a shield using some angle aluminium, with the coil and caps being on the side opposite the tube. The triode half of the tube faces away from both the Pi network and the transformer. The tube is at the back left corner, the Pi network in the middle front and the transformer is at the back right corner. The crystal sockets are on the front left - also on the side of the angle aluminum opposite the Pi network. Underneath, I used tag strips and the tube socket for point to point wiring. The thing is grounded and fused (on the live lead).

On the middle back, above the chassis is a DPDT relay. There is a TX/RX switch on the front of the chassis. When on TX, the B+ is connected to the tube circuit and the relay switches the output of the Pi network to the antenna. In addition, the RX antenna connection going FROM the TX is grounded, in an attempt to squelch the RX (this works quite well). In RX mode, the B+ is disconnected (in order to stop the local oscillator from blotting out the weak signals), and the antenna is switched to the RX by the

relay.

The TX is keyed by switching the pentode's cathode to ground. A cap is across this connection in order to declick the TX.

I have been unable to get the TX to work well at 40M. When I use a 7.x MHz xtal, the voltage swing across the xtal is similar to that of the 80M xtal (thus, the swing at the triode's grid is similar). However, the voltage swing at the triode plate is about half. The swing on the pentode plate is half that again at 40M (although the reason here might be explainable - see further down). I have adjusted various components, applied decoupling caps, etc. all to no avail. I have completely disconnected the pentode stage components, leaving just the triode oscillator feeding nothing. I have even swapped tubes, with the same results.

Others have told me that any modern sweep tube should be able to deal with 7MHz without difficulty. This is a VERTICAL sweep tube. Does that make a difference?

I can understand why the pentode stage will consume more DC with a smaller input swing, due to its self biased grid (choke and resistor to ground with DC blocking cap connecting grid to triode's plate). However, I am having trouble understanding why the triode's plate swing is half at the higher frequency (with the same grid drive) if I am not running into the frequency limit of the device.

If I am limited to 80M, I am still happy. But part of the reason for this exercise is to learn - so I would like to find the cause of the above phenomenon. If it is the device's limit, fine. But if it is a problem in my circuit/layout, I want to fix it. Some more research is in order.

Although very secondary, I elected to make sure the cosmetics of the device are reasonable (after all, I do want to show it off ;-)). So I spray enamelled the chassis and angle aluminium a machine metal grey and the transformer a matt black (the transformer was already black, but looking pretty shabby). A can of primer and a can of each colour in Rustoleum's Professional series did a beautiful job. It looks very clean, but industrial now. A benefit of the enamel is its hard coating - I bet the thing will be a more durable now (naked aluminium scratches so easily).

Well, that's about it (more than enough, perhaps). If anyone has any questions I can answer, I'll be more than willing to do so. If anyone has any feedback on my 40M difficulties, I'll be more than willing to listen.

Cheers,

--

Chris F. Broadbent (KC5VQL)

Date: Wed, 16 Oct 1996 12:19:31 +0000
From: "Brian Carling" <bry@mail1.mnsinc.com>
To: GLOWBUGS@THEPORCH.COM
Subject: Parts needed (tubular!)
Message-ID: <199610161918.PAA16121@user2.mnsinc.com>

My LIST of parts needed for building a tube xmtr:
(parts must be at the junk box level - do not have to be new, just working!)

1) Chassis - preferably 9 X 12 X 4" with base cover.

2) Matching box - sure, no problem, he he!

3) Tubes: (QTY depends on price)

807
1625
12BY7
6146
6L6
6AQ5A
6CL6
OD3
OC3

4) Tube sockets: for all of the above tubes.

5) Transmitting Variable capacitors, low to medium power level:

30 pF (or 47 pF) trimmer
100 pF
150 pF
200 pF
365 pF

6) 2.5 mH RF Chokes 100 mA or 250 mA preferred.

7) Capacitors:

20 pF mica
22 pF mica
100 pF mica
180 pF mica
220 pF mica

270 pF mica
470 pF mica
.001 uF at 600 V and at 2000 V or at 1000 V
.005 uF at 600 V and at 1000 V
.01uF at 200 V and 600 V or 1000 V
.05uF at 1000 V or more

8) Resistors:

5 K 10 watts
22 K 1 watt or 2 watt
10 ohm 1 watt
330K 2 watt (need QTY 4-8)
27 K 1/2 watt or 1 watt
100 K 1/2 watt or 1 watt
47 ohm 1 watt
470 ohm 1/2 watt or 1 watt
220 k ohm 1/2 watt
2 K or 2.2 K 1 watt

9) Meter - prefer medium size 0-100 mA

10) FT-243 crystals

1805 - 1850 kHz
3515 - 3550 kHz
7010 - 7050 kHz

I only need xtals in THE above frequency ranges.

Please call (301) 990-6070 or e-mail to:
bry@mnsinc.com

Radio AF4K
Brian Carling
Brian Carling in Gaithersburg, Maryland, USA
bry@mnsinc.com
<http://www.mnsinc.com/bry/>

Date: Wed, 16 Oct 1996 15:31:39 -0400
From: "Robert Fowle (KC8DBC)" <hammarlund@jacksonmi.com>
To: boatanchors@theporch.com
Cc: glowbugs@theporch.com
Subject: RCA BTA 5T 5kw PARTS FS:
Message-ID: <2.2.16.19961016153643.2bdffc56@fvmail.com>

I HAVE :

PETER DAHL BTA 5R/T MODULATION TRANSFORMER, 5KW
elctro eng. works reactor (modulation) type e12497 21henry 1.5adc
3,000vrms 34

ohm dcr
electro eng. works reactor type 11654-a 3henry 360 cps 6.7 dcr ind
rms 375 pk

7,500 v

Jennings: 500pf vaccumm variable

Jennings: 1000 pf fixed

Jennings: 75 pf vaccumm variable

3x3000T1 tube rebuilt by Econco

MICA's: sangamo type G3B .0002 @ 20,000 pkv 5.6amp @ 1,000kcs

sangamo type G3B .002 @ 15,000 pkv 20 amp @ 1,000 kcs

sangamo type G3B .00033 @ 20,000 pkv 7.5 amp @ 1,000 kcs

sangamo type G3B .003 @ 12,000 pkv 24 amp @ 1,000kcs

aerovox type 1970S .001 @ 20,000 pkv 15a @ 3,000kcs

13a @ 1,000kcs

7.5a @ 300kcs

blower 1.5 hp 3ph cabable of 2.2 @ 120 cfm

also have all the tunning coils,

1> EF JOHNSON EDGEWOUND 31 TURNS 5"DIA

HAS INTERNAL BARREL FOR NULLING

2> EFJ EDGEWOUND 55 TURNS 5" DIA

WITH INTERNAL BARREL

3> EFJ EDGEWOUND 24 TURNS 7 7/8" DIA

INTERNAL BARREL ELECTRIC OPERATED

4>EFJ EDGEWOUND 34 TURNS 8 " DIA

NOTHING INSIDE

reactors, filiment xfmr's (7.7v@51a, & 12.6v @ 29a)

have mag. switches 70a rated (2)

and most anything else from an RCA BTA 5T 5kw transmitter....

all items are 'make reasonable offer' plus shipping (although, pickup on
heavy items would be

nice, but not a must)

location address & phone number, are in my sig.

=====]-[->

Robert Fowle KC8DBC

The HAMMARLUND Historian

Ph. 517-789-6721

1215 Winifred
Jackson, Mich. 49202-1946
E-mail: hammarlund@jacksonmi.com
Web Page: <http://www.jacksonmi.com/hammarlund>
HAMMARLUND LITERATURE WANTED
WANTED: MANUALS FOR ANY MAKE RADIO EQUIPMENT
=====]-[->
Boatanchors: the list: listproc@theporch.com.....subscribe boatanchors
<your name>
the news group: rec.radio.amateur.boatanchors

Date: Wed, 16 Oct 1996 13:12:32 -0700
From: jeffd@coriolis.com (Jeff Duntemann)
To: glowbugs@theporch.com
Subject: Free CDs for dial plates
Message-ID: <1.5.4.32.19961016130914.0095ed3c@ntserver.coriolis.com>

Guys--

I cleaned my office this week and now have a pile of useless CDs. Many of you will recall my suggestion (which I've used and proven out) that CDs are about the right size for dial plates on reduction drives like Jackson Brothers, especially for glowbug-scale equipment. If anybody wants to try it, I'll be happy to send two CDs to anyone who provides a stamped, self-addressed diskette mailer on it with 78 cents or more postage. (I tried it here and that's what a typical diskette mailer and 2 CDs takes.) Each has one clean side. The other sides often have printing or sticky labels on them. A few are clear on both sides. These are mostly bad "gold disks" we used for mastering our book CDs.

It's either this or they feed the dumpster. I have plenty in my stash at home.

Send the mailers to:

Jeff Duntemann
Coriolis Group Books
7339 E. Acoma Drive, Suite 7
Scottsdale AZ 85260

--73--

--Jeff Duntemann KG7JF
Scottsdale, AZ

Date: Wed, 16 Oct 1996 17:14:31 -0400 (EDT)
From: rdkeys@csemail.cropsci.ncsu.edu
To: glowbugs@theporch.com
Cc: rdkeys@csemail.cropsci.ncsu.edu ()
Subject: Found a nice 1843khz rock source for glowbugging
Message-ID: <9610162114.AA105149@csemail.cropsci.ncsu.edu>

Whilst plying amidst the piles of ancient junk pc boards from long gone eras..... I found a very nice 1843 khz rock on the Zenith PC serial board. It was used as the clock there, and is a big standard sized rock with wire leads (FT-243 sized case, and HC-6? wires) that should work well for the firing of glowbugge holes in yonder ether.....(:+}}..... Some have canned oscillators but many of the early ones have real xtals of sufficient size to work without fracturing.

73/ZUT DE NA4G/Bob UP

p.s. What a fine use it be for old ancient sand state computers --- to be torn up for glowbugging use! The cat's meow it be.....(:+}}.....

Date: Wed, 16 Oct 1996 15:32:55 -0700
From: mjsilva@ix.netcom.com (michael silva)
To: glowbugs@theporch.com
Subject: Re: Status Report on 6LR8 based TX
Message-ID: <199610162232.PAA00543@dfw-ix12.ix.netcom.com>

>I have been unable to get the TX to work well at 40M. When I use a 7.x MHz
>xtal, the voltage swing across the xtal is similar to that of the 80M xtal
>(thus, the swing at the triode's grid is similar). However, the voltage
>swing at the triode plate is about half.

Chris,

Glad that you got your rig running and gave us a report -- that's what the list is for, IMHO. What kind of a plate load are you using on your triode? If it's an RF choke it almost certainly has a resonant frequency well below 3.5 MHz, so it's really acting as a capacitor at 3.5 and 7 MHz. Everything else being equal (ha ha!) you would expect

about half the output voltage at twice the frequency with a capacitive load. You might try a smaller choke (it will have less stray capacitance so your load impedance will actually be higher) and/or a resistor in series with the choke. The resistor *may* increase your plate load impedance more than it lowers your gm -- don't know if it will, but I'd try it for the heck of it. Other than that I'd look at your grid resistor and feedback cap values.

If you're still worried that your tube doesn't have what it takes at 7 MHz I can show you an article about a WW-2 era civil defense transmitter that used a 6V6 (audio output tube) at 112 MHz!

73,
Mike, KK6GM

73,
Mike, KK6GM

Date: Wed, 16 Oct 1996 18:10:12 -0700
From: mjsilva@ix.netcom.com (michael silva)
To: glowbugs@theporch.com
Subject: Re: Status Report on 6LR8 based TX
Message-ID: <199610170110.SAA24235@dfw-ix10.ix.netcom.com>

One more comment on the suitability of a vertical osc/amp tube for TX use: In the mid '50s the ARRL Handbooks had a MOPA rig based on the 6BL7 vertical osc/amp dual triode. They had the rig operating on 80 and 40 meters with an output of 10 watts (same as the dissipation rating per triode). I think this is another indication that Chris' output of around 15 watts from his rig is reasonable (who knows, maybe the editor heard "fifty" for "fifteen" over the phone?), and I'm convinced that Chris' tube should be capable of similar output on 40 with the right circuit and component values.

73,
Mike, KK6GM

Date: Wed, 16 Oct 1996 15:24:56 -1000
From: Jeffrey Herman <jherman@hawaii.edu>
To: Boatanchors List <boatanchors@theporch.com>
Subject: email list devoted to AM

Message-ID: <Pine.GS0.3.93.961016152024.20956B-100000@uhunix3>

I was just perusing the index of available ham email lists reflected through ucsd.edu and found one devoted to AM. To sub, send an email to listserv@ucsd.edu and only write:

add ham-am

and you should be hooked up. To get the entire index of ham lists, write the command:

index

or

longindex (this version will include a description of each list).

As if we don't already have enough to read...

Jeff KH2PZ

Date: Wed, 16 Oct 1996 20:48:28 -0500 (CDT)
From: Bob Roehrig <broehrig@admin.aurora.edu>
To: rdkeys@csemail.cropsci.ncsu.edu
Cc: Multiple recipients of list <glowbugs@theporch.com>
Subject: Re: SAQ Alternator Test Transmission
Message-ID: <Pine.ULT.3.95.961016204727.20770A-100000@admin.aurora.edu>

On Tue, 15 Oct 1996 rdkeys@csemail.cropsci.ncsu.edu wrote:

> The Alexanderson Alternator test on 17.2 khz will be changed slightly
> in time from: 0945Z-1015Z 23 October 1996
>
> to: 0900Z-0930Z 23 October 1996
>
> according to news on the BA list from Sweden. That translates to about
> 5 am EST, by my book.

According to ARLX018, they are also supposed to test around 1100Z on October 21.

E-mail broehrig@admin.aurora.edu 73 de Bob, K9EUI
CIS: Data / Telecom Aurora University, Aurora, IL

Date: Thu, 17 Oct 1996 01:11:59 -0500
From: Conard Murray <conard@tntech.campus.mci.net>
To: glowbugs@theporch.com
Subject: VLF Frequency List
Message-ID: <1.5.4.32.19961017061159.00691f70@tntech.campus.mci.net>

thought this might be handy....
73 de Conard ws4s

>Date: Wed, 16 Oct 1996 10:38:42 -0500 (CDT)
>Errors-To: listown@jackatak.theporch.com
>Reply-To: alklase@prolog.net
>Originator: boatanchors@theporch.com
>Sender: boatanchors@theporch.com
>From: Al Klase <alklase@prolog.net>
>To: Multiple recipients of list <boatanchors@theporch.com>
>Subject: VLF Frequency List
>X-Listprocessor-Version: 6.0c -- ListProcessor by Anastasios Kotsikonas
>X-Comment: Amateur Radio Equipment Using Vacuum Tubes
>
>At 08:31 PM 10/15/96 -0500, WB6TMY wrote:
>>I am seeking someone knowledgeable about long wave reception in
>>Northern California. I would like to attempt reception of SAQ on
>>the Alexanderson Alternator & need to know what other signals I
>>should be able to hear in this area to have a reasonable chance
>>of success.
>
> Try these freq's. West coast should at least be able to hear NLK
>24.4 KC.
>
>73, Al
>
>
>VLF, LF stations worldwide
>
>Freq/Khz ID Location Remarks
>-----
>0.076 Clam Lake, Wisconsin US Navy VLF sys
>10.2 OMEGA Common Freq
>11.05 OMEGA Common Freq
>11.3 OMEGA Common Freq
>11.8 OMEGA Haiku, Hawaii
>11.905 ** ALPHA USSR
>12.0 OMEGA Monrovia, Liberia
>12.1 OMEGA Aldra, Norway
>12.3 OMEGA La Reunion Island

>12.649 **	ALPHA	USSR	
>12.8	OMEGA	Tsusshima, Japan	
>12.9	OMEGA	Gulf Nuevo, Argentina	
>13.0	OMEGA	Austalia	
>13.1	OMEGA	LaMore, North Dakota, USA	
>13.6	OMEGA		Common Freq
>14.881 **	ALPHA	Krasodar, USSR	
>15.1	HWU	Leblnc, France	FSK
>16.0	GBR	Rugb, England	
>16.2	UMS	USSR	CW, RTTY
>16.7	JXZ	Oslo Norway	Kolsaas Naval Base
>16.8	FTA2	St. Arisse, France	Multiplex RTTY
>17.1	UMS	USSR	CW, RTTY
>18.1	UMS	USSR	CW, RTTY
>18.5	DH038	WestGermany	CW
>19.0	GQD	Anthrn, England	
>19.0	G33DG		NATO ID of GQD
>19.6	GBZ	Crigion, Wales	FSK
>20.0	???	???	FSK
>20.5	UTR3	Gork, USSR	
>	UQC3	Khabrovsk, USSR	
>	UNW3	Estoia, USSR	
>	UPD8	Murmnsk, USSR	
>	USB2	Bielrussia	
>21.1	3SB	P. Rpublic China	CW, RTTY
>21.4	NSS	Annaolis, MD	US Navy MSK
>22.3	NWC	Harod E. Holt, Australia	US Navy MSK
>23.0	(same as 20.5)		
>23.4	NPM	Lualualue, Hawaii	US Navy MSK
>24.0	NAA	Cutler, Maine	US Navy MSK
>24.8	NLK	Jim Creek, Washington	US Navy MSK
>25.0	(same as 20.5)		
>25.1	(same as 20.5)		
>25.5	(same as 20.5)		
>25.8	???	???	FSK
>26.5	???	???	FSK
>27.9	3SV	China, P Republic	
>28.5	NAU	Aguada, Puerto Rico	US Navy MSK
>			
>			
>			
>A1 Klase - N3FRQ			
>alklase@prolog.net			
>Flemington, NJ			
>			
>			
>Conard Murray WS4S NNNOUTN		conard@tntech.campus.mci.net	
217 Dyer Avenue		BA/GB net 1802.5/3579.5/7050 KHz	

Cookeville, Tn 38501
615-526-4093

- LICENSED ONLY TO EXTENT INDICATED ON CARTON -

Date: Thu, 17 Oct 1996 05:22:11 +0000
From: "Brian Carling" <bry@mail1.mnsinc.com>
To: sigcom@juno.com (Stephen M Smith)
Subject: Re: QRP xmtrs
Message-ID: <199610171219.IAA04662@user2.mnsinc.com>

HEY! It's a reply from AF4K!
On 17 Oct 96, Stephen M Smith wrote:

> Check JAN Crystals down in FL. They still have FT243s. Last price
> I saw was real reasonable. Let me know if you need the addr/phone.
>
> 73.....Steve, WB6TNL

OK thanks, Steve!
I will copy this to glowbugs too, as I expect a lot of folks need
that information.
I have the address in my file xtals.txt
It's available for anyone who needs it over on my Web Page!
In the ham files section. See URL below, everyone!

I think I will order a few FT243s from them. Thanks Steve!

Brian Carling in Gaithersburg, Maryland, USA
bry@mnsinc.com
<http://www.mnsinc.com/bry/>

End of GLOWBUGS Digest 323
